

I claim:

1. A method for manufacturing a vaned diffuser (101) of a turbocharger, wherein said diffuser has an axis (115) for separating said diffuser from a rigid mold thereof by translation along said axis, said method comprising casting said diffuser in a plaster mold.

2. A method for casting a vaned diffuser (101) of a type used in a turbocharger for receiving high velocity air from a compressor wheel and supplying compressed air to an internal combustion engine, said vaned diffuser consisting mainly of a non-ferrous metal or alloy having a melting point of less than about 700°C, and said diffuser comprising an upper surface (105) and a plurality of vanes (113) radially disposed on said upper surface, the method comprising:

- (a) providing a male metallic template (201) comprising at least the upper surface of said diffuser (105) and further comprising a central hub (205) having an axis (207) approximately perpendicular to said upper surface;
- (b) casting a female plaster mold corresponding to said male metallic template by contacting said template with a plaster slurry within a suitable frame and permitting said slurry to harden;
- (c) separating the female plaster mold from the male metallic template by pulling along said axis (303);

- (d) filling said female plaster mold with a molten non-ferrous metal or alloy having a melting point of less than about 700 °C;
 - (e) cooling said mold to form a raw vaned diffuser casting (407);
 - (f) separating the raw vaned diffuser casting from the female plaster mold by pulling along said axis (403); and
 - (g) finish machining the raw vaned diffuser casting (407) to form the vaned diffuser (101).
3. The method according to claim 1 or claim 2, in which said vaned diffuser consists mainly of aluminum or an aluminum alloy.
4. The method according to claim 2, in which said hub (205) further comprises a plurality of ribs (209) radially disposed around said axis and axial to said surface.
5. The method according to claim 4, further comprising the step of evacuating said female plaster mold during step (e).
6. The method according to claim 4, wherein said vaned diffuser (101) is separated from said raw vaned diffuser casting (407) by machining away material disposed between said hub (205) and said vanes (113).
7. The method according to claim 6, wherein said ribs (209) and said vanes (113) of said male metallic template (201) are radially separated, wherein the

ratio of the diameter of the template to the distance of the separation is from about 10 to about 15.

8. The method according to claim 2, further comprising the step, between steps (f) and (g), of machining the lower surface of said raw vaned diffuser casting.
9. The method according to claim 2, further comprising the step, between steps (f) and (g), of machining the outer circumferential edge of said raw vaned diffuser casting.
10. The method according to claim 2, further comprising the step, between steps (f) and (g), of tempering the raw vaned diffuser casting.
11. The method of claim 1 or claim 9, in which said raw vaned diffuser casting is gripped for machining by said hub.